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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/770,907	01/26/2001	Jacob Cherian	6661.US.02	7756

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Roger Fulghum
Baker Botts L.L.P.
One Shell Plaza
910 Louisiana Street
Houston, TX 77002-4995

EXAMINER

EL CHANTI, HUSSEIN A

ART UNIT	PAPER NUMBER
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2157

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/770,907

Applicant(s)

CHERIAN ET AL.

Examiner

Hussein A. El-chanti

Art Unit

2157

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5, 7, 9-26, 28 and 30-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 7, 9-26, 28 and 30-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

1. This action is responsive to amendment received on July 27, 2005. Claims 1-3, 5, 7, 9-26, 28 and 30-34 are pending examination.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 5, 7, 10-26, 28 and 31-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Kirby, U.S. Patent No. 6,526,478.

As to claim 1, Kirby teaches a method for correlating the execution throttle levels of the servers of a network to the command queue depth of the storage controllers in the network, each of the storage controllers managing one or more logical storage units, comprising the steps of:

identifying the servers of the network (see col. 9 lines 20-col. 10 lines 6, the servers are identified);

identifying the logical ownership of each logical storage unit on the network (see col. 9 lines 20-col. 10 lines 6, the mapping table identifies the logical ownership of each of the disk storages);

verifying that a rule governing the command throughput of the servers and storage controllers of the network is satisfied, the rule defining a relation between the execution throttle levels of the servers of the network and command queue depth of the storage controllers of the network (see col. 7 lines 10-col. 8 lines 53, determines the I/O ratios, available disk space and load imbalance); and

adjusting the execution throttle level of at least one server of the network in response to a determination that the rule was not satisfied (see col. 7 lines 10-col. 8 lines 53, the LUN allocation is adjusted to meet the I/O load).

As to claim 14, Kirby teaches a storage area network, comprising:

a plurality of servers within the network, each server having an execution throttle;
a plurality of storage controllers coupled to the network,

each storage controller having a command queue depth, and

each storage controller managing one or more logical storage units; wherein the execution throttle level of each server is set such that the execution throttle of each server is correlated to the command queue depth of each storage controller (see col. 7 lines 10-col. 8 lines 53).

As to claim 21, Kirby teaches a method for setting the execution throttle levels of a plurality of servers in a storage area network, the storage area network including a plurality of storage controllers, each of the storage controllers having associated therewith one or more logical storage units, comprising the steps of;

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identifying for each storage controller the servers that logically own each of the logical storage units managed by the storage controller (see col. 7 lines 10-col. 8 lines 53);

summing, for each storage controller, the execution throttle levels of the servers that are identified as owning the logical storage units managed by the storage controller;

determining, for each storage controller, whether the summed execution throttle level exceeds the command queue depth of the storage controller; and if the summed execution throttle level exceeds the command queue depth (see col. 7 lines 10-col. 8 lines 53),

adjusting the execution throttle level of one or more of the servers of the storage area network (see col. 7 lines 10-col. 8 lines 53).

As to claim 22, Kirby teaches a method for correlating the execution throttle levels of the servers of a network to the command queue depth of the storage controllers in the network, each of the storage controllers managing one or more logical storage units, comprising the steps of:

identifying the servers of the network; identifying the logical ownership of each logical storage unit of on the network; providing independent server execution throttles for each storage controller that is accessed by the servers (see col. 7 lines 10-col. 8 lines 53);

verifying that a rule governing the command throughput of the servers and storage controllers accessed by the servers is satisfied, the rule defining a relation between the independent execution throttle levels of the servers accessing the storage controllers and command queue depth of those storage controllers (see col. 7 lines 10-col. 8 lines 53);

adjusting the independent execution throttle level of at least one server in response to a determination that the rule was not satisfied (see col. 8 lines 20-67);

As to claims 2 and 15, Kirby teaches the method of claims 1 and 14 respectively, wherein the rule provides that for each storage controller of the network, the sum of the execution throttle levels of the servers having logical ownership over a LUN of the storage controller does not exceed the command queue depth of the storage controller (see col. 7 lines 10-col. 8 lines 53).

As to claims 3 and 24, Kirby teaches the method of claims 2 and 23 respectively, wherein the step of adjusting the execution throttle level of at least one server comprises the step of decrementing the execution throttle level for a selected server that is associated with the storage controller for which the rule was not satisfied (see col. 7 lines 10-col. 8 lines 53).

As to claims 5 and 26, Kirby teaches the method of claims 3 and 24 respectively, wherein the selected server is the server that has the highest execution throttle (see col. 7 lines 10-col. 8 lines 53).

As to claim 6, Kirby teaches the method of claim 4, wherein the selected server is the server that has the lowest execution throttle (see col. 7 lines 10-col. 8 lines 53).

As to claim 7, Kirby teaches the method of claim 4, wherein the selected server is the server that has the highest input/output demand (see col. 7 lines 10-col. 8 lines 53).

As to claim 8, Kirby teaches the method of claim 3, wherein the selected server is the server that has the lowest input/output demand (see col. 7 lines 10-col. 8 lines 53).

As to claims 10 and 31, Kirby teaches the method of claims 5 and 26 respectively, further comprising the step of repeating the verifying and adjusting steps until the sum of the execution throttle levels for those servers having logical ownership over each respective storage controller does not exceed the command queue depth of each respective storage controller (see col. 7 lines 10-col. 8 lines 53).

As to claims 11 and 32, Kirby teaches the method of claims 10 and 31, further comprising the step of determining whether the execution throttle of each server exceeds a minimum execution throttle setting (see col. 7 lines 10-col. 8 lines 53).

As to claims 12 and 33, Kirby teaches the method of claims 11 and 32 respectively, wherein the verifying and adjusting steps are automated (see col. 7 lines 10-col. 8 lines 53).

As to claims 13 and 34, Kirby teaches the method of claims 12 and 33 respectively, further comprising the step of setting the execution throttle level of each

server to its maximum level prior to performing the first of the verifying and adjusting steps (see col. 7 lines 10-col. 8 lines 53).

As to claim 16, Kirby teaches the storage area network of claim 15, wherein the execution throttle level of the servers may be adjusted such that the sum of the execution throttle level of those servers having logical ownership over a respective storage controller does not exceed the command queue depth of the respective storage controller (see col. 7 lines 10-col. 8 lines 53).

As to claim 17, Kirby teaches the storage area network of claim 16, wherein the execution throttle level of the servers of the storage area network may be adjusted and verified repeatedly until the sum of the execution throttle level of those servers having logical ownership over a respective storage controller does not exceed the command queue depth of the respective storage controller (see col. 7 lines 10-col. 8 lines 53).

As to claim 18, Kirby teaches the storage area network of claim 17, wherein the execution throttle level of each server further exceeds a minimum execution throttle level (see col. 7 lines 10-col. 8 lines 53).

As to claim 19, Kirby teaches the storage area network of claim 18, wherein the adjustment and verification of execution throttle level is automated (see col. 7 lines 10-col. 8 lines 53).

As to claim 20, Kirby teaches the storage area network of claim 19, wherein the execution throttle level of each server is set to its maximum level prior to adjusting or

verifying the execution throttle levels of any of the servers of the storage area network (see col. 7 lines 10-col. 8 lines 53).

As to claim 25, Kirby teaches the method of claim 23, wherein the step of adjusting the execution throttle level of at least one server comprises the step of incrementing the execution throttle level for a selected server that is associated with the storage controller for which the rule was not satisfied (see col. 7 lines 10-col. 8 lines 53).

As to claim 28, Kirby teaches the method of claim 25 wherein the selected server is the server that has the highest command throughput (see col. 7 lines 10-col. 8 lines 53).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 9 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kirby in view of Popat, U.S. Patent No. 5,623,672.

Kirby teaches the method of adjusting the execution throttle level of at least one server comprises the step of decrementing the execution throttle level for a selected server that is associated with the storage controller for which the rule was not satisfied (see col. 7-8).

Kirby does not explicitly teach the limitation "the selected server is selected according to a round robin format".

However Popat teaches a method for dynamic priority assignment to access a resource where the invention include round robin between groups and fixed priority within a group; round robin between groups and round robin within a group; and fixed priority.

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify Kirby by implementing round robin format as taught by Popat because doing so would allow the system to establish request priority to each group and within each group and therefore give more weight to requests received from a group (see Popat col. 6 lines 19-33).

Response to Arguments

4. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.
5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hussein A. El-chanti whose telephone number is (571)272-3999. The examiner can normally be reached on Mon-Fri 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571)272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hussein El-chanti

Oct. 17, 2005


ARIO ETIENNE
SUPERVISORY PATENT EXAMINER